Logic and Probability, EPFL, Fall 2011
Homework 2

(due Wednesday, November 9, 2011, at the beginning of class)

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Problem 1 *Prove Lemma 7.1; but first restate the lemma completely rigorously by defining what is meant by "graph property" (not necessarily FO definable) and the relationship with events in the probability space(s) of the random graph.*

Problem 2 *Recall the almost sure theory $\mathcal{S}$ defined at the beginning of Section 11.* Without using the extension axioms *prove that $\mathcal{S}$ has no finite models.*

Problem 3 *Prove that if $T_1 \subseteq T_2$ are theories such that T_2 is consistent and T_1 is complete then $T_1 = T_2$.*

Problem 4 *Refer to the proof sketch for Theorem 12.1. Prove that $Th(UEA)$ is $\omega-$categorical.*

Problem 5 *Refer to the proof sketch for Theorem 12.1. You can assume that $\lim_{n\to\infty} n\,p(n) = \lim_{n\to\infty} n(1-p(n)) = \infty$. Show that the sentences in UEA hold almost surely.*